REMARKS

Claims 1-13 are pending in this application.

Rejection of Claims 1-4, 7 and 10 under 35 USC § 103(a)

Claims 1-4, 7 and 10 remain rejected under 35 USC § 103(a) as being unpatentable over Kerdranvrat in view of Lee.

The present claimed invention describes a method of movement estimation for a sequence of images including segmentation of a current video image into image blocks. Movement estimation occurs per image block between the current image and a previous image in order to obtain a movement vector field for the current image. A stage of reassignment of a vector to a block occurs by selecting one movement vector from among N predominant vectors. The predominant vectors are the ones of the group of vectors belonging to the movement vector field for the current image and at least to the movement vector field for a preceding image corresponding to a movement vector field between the preceding image and a further preceding image. The vectors are scaled according to the temporal distance to which they correspond.

The present claimed invention reassigns a vector to a block. This reassignment is accomplished by selecting a motion vector from among the predominant motion vectors of the previous image (the motion between the previous image and the current image) and the predominant motion vectors of the image before the previous image (the motion between the previous image and the image preceding it).

Kerdranvrat describes "reassigning a vector to each block of pixels of... [a given] image. The reassigning...consists...[of] using the vectors selected by the preceding phases...in seeking...the vector best able to represent th(e) block" (Col. 7, lines 42-46). Subsequently, "a set of dominant vectors [is extracted] from the n x n blockwise field of vectors which already comprises a reduced number of vectors" (Col.2 lines 14-17).

The preceding phase in which Kerdranvrat describes the selection of vectors consists of a time filtering phase. In this time filtering phase, a time filter is applied to the table SORT. This application consists of comparing the Nmax vectors of the table SORT transferred to MEM1 with those vectors which were extracted as dominant vectors from the preceding image and are contained in a buffer memory MEM2 (Col. 7, lines 11-25). This comparison is used to select a dominant vector **for each motion vector field**. Subsequently, the dominant vectors of each field are compared.

The Office Action asserts that Kerdranvrat discloses predominant vectors from a group of vectors belonging to a first and a second motion vector field. However, Kerdranvrat, as discussed above, discloses selecting a dominant vector for each motion vector field. Thus, a first dominant motion vector is **selected from a first motion vector field** and a second dominant motion vector is **selected from a second motion field**. Subsequently, the first and second dominant vectors are compared. This is unlike the present claimed invention which **selects "one movement vector from** N predominant vectors...of the group of vectors belonging **the movement vector field for said current image and at least to the movement vector field for a preceding image**" as recited in claim 1 of the present invention. In fact, the present claimed invention allows for choosing a dominant vector from among multiple motion vector fields (more than 2). Therefore, Kerdranvrat neither discloses nor suggests "a stage of reassignment of a vector to a block by selecting **one movement vector from among N predominant vectors**, wherein the predominant vectors are the ones of the group of vectors **belonging to the movement vector field for said current image and at least to the movement vector field for a preceding image** corresponding to a movement between said preceding image and a further preceding image" as recited in claim 1 of the present invention.

Additionally, Kerdranvrat describes two steps. The first step described by Kerdranvrat calculates a dominant vector for each motion vector field and the second step described by Kerdranvrat eliminates the secondary maxima in a motion vector field. The temporal filtering of the second step is executed **after** the calculation of predominant vectors.

This first step in this method described by Kerdranvrat is concerned with the grouping of predominant motion vectors **from each motion vector field**. This grouping of predominant motion vectors is then used to calculate a **histogram for a current image and a histogram for a previous image**. These histograms are then combined in the second step to eliminate vectors which do not correspond to dominant motions by taking into account the temporal correlation of the motion vectors due to the continuity of the motion in the sequence of images.

In contrast, the present claimed invention utilizes **a single histogram**. This histogram details the grouping of the N predominant vectors so that "a stage of reassignment of a vector to a block [is achieved] by selecting one movement vector from among N predominant vectors" (Claim 1). This single histogram (of predominant motion vectors) takes into account more than one motion vector field to obtain the "spatial" dominant motions in the current image as well as the "temporal" dominant motions (due to the temporal filtering obtained by taking into account several images in the sequence).

The goal of selecting a predominant motion vector from among vectors belonging to two or more motion vector fields (i.e. a single histogram for more than one image) is to achieve increased coherence between the motion fields of successive images. Thus, the calculation of backward and forward motion vectors of a B image can be made by taking into account the motion vector field between the P images framing the B image. In this way, the "signal to noise ratio" of the motion vector fields is increased and the cost of coding is reduced while simultaneously improving coherence due to the fact that the coding is a differential coding.

Thus, the method disclosed by Kerdranvrat, which **selects** vectors **from a first histogram and** then vectors **from a second histogram** and performs a **filtering among the selected vectors**, is wholly unlike that of the present claimed invention which performs "a stage of reassignment" using only **one histogram** in which the **filtering is performed on all the motion vectors** of the two motion vector fields to get the predominant vectors. Therefore Kerdranvrat neither discloses nor suggests "a

stage of reassignment of a vector to a block by selecting **one movement vector from among N predominant vectors**" as recited in claim 1 of the present invention.

Lee discloses an image encoding scheme in which two or more different sets of motion vectors are generated for each image that is to be encoded using motion estimation. However, similarly to Kerdranvrat, Lee neither discloses nor suggests "a stage of reassignment of a vector to a block by selecting one movement vector from among N predominant vectors, wherein the predominant vectors are the ones of the group of vectors belonging to the movement vector field for said current image and at least to the movement vector field for a preceding image corresponding to a movement between said preceding image and further preceding image" as recited in claim 1 of the present invention. Furthermore, there is no suggestion in Lee regarding selecting predominant vectors from among two motion vector fields as in the present claimed invention.

Additionally, it is respectfully submitted that the combination of the systems of Kerdranvrat and Lee, similarly to the individual systems of Kerdranvrat and Lee, would not produce the system of the present claimed invention which utilizes multiple motion vector fields. Specifically, the combined system formed from Kerdranvrat and Lee would operate only to classify vectors between successive images. The combined system would not take into account a movement vector field for a current image and a movement vector field for a preceding image. Thus, the combined system would not be able to reassign vectors as in the present claimed invention. Therefore, it is respectfully submitted that the combined system, similarly to the individual systems of Kerdranvrat and Lee, would neither disclose nor suggest "a stage of reassignment of a vector to a block by selecting one movement vector **from among N predominant vectors**, wherein the predominant vectors are the ones of the group of vectors **belonging to** the movement vector field for said current image **and at least to** the movement vector field for a preceding image corresponding to a movement between said preceding image and further preceding image" as recited in claim 1 of the present invention.

In view of the above remarks and amendments to claim 1, it is respectfully submitted that Kerdranvrat and Lee, when taken alone or in combination, provide no 35 USC 112 compliant enabling disclosure that makes the present claimed invention obvious. As claims 2 – 13 are dependent on independent claim 1, it is respectfully submitted that claims 2 – 13 are also not obvious in view of Kerdranvrat and Lee, when taken alone or in combination, for the same reasons above concerning claim 1. Thus, it is respectfully submitted that this rejection has been satisfied and should be withdrawn.

Having fully addressed the Examiner's rejections, it is believed that, in view of the preceding amendments and remarks, this application stands in condition for allowance. Accordingly then, reconsideration and allowance are respectfully solicited. If, however, the Examiner is of the opinion that such action cannot be taken, the Examiner is invited to contact the applicants' attorney at the phone number below, so that a mutually convenient date and time for a telephonic interview may be scheduled.

No additional fee is believed due. However, if an additional fee is due, please charge the applicable fee to Deposit Account No. 07-0832.

Respectfully submitted,

Christophe Chevance et al.

By: _____

Jack Schwartz, Attorney for Applicants
Registration No. 34,721
Telephone No. (609)734-6866

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Thomson Licensing Inc.
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Patricia M. Fedorowycz